What Is Claimed Is:

1. A cleaning method of an apparatus for manufacturing a semiconductor device, comprising:

providing a first cleaning gas and a second cleaning gas into a chamber, and forming a mixture of the first cleaning gas and the second cleaning gas, the first cleaning gas including a fluorocarbon gas and an oxygen gas, the second cleaning gas including nitrogen;

activating the mixture of the first cleaning gas and the second cleaning gas by a high frequency power; and

exhausting residues cleaned by the activated mixture and remaining gases.

2. The method according to claim 1, wherein the fluorocarbon gas is one of C_3F_8, C_4F_8 and C_4F_8O.

3. The method according to claim 1, wherein the second cleaning gas includes one of N_2, N_2O and NO.

4. The method according to claim 1, wherein a flow rate of the fluorocarbon gas to the oxygen gas is within a range of 0.1 to 0.5.

5. The method according to claim 1, wherein a flow rate of the second cleaning gas to the first cleaning gas is within a range of 0.01 to 0.5.

6. The method according to claim 1, wherein the mixture of the first cleaning gas and the second cleaning gas is activated in a plasma generator outside the chamber.

7. The method according to claim 1, wherein the mixture of the first cleaning gas and the second cleaning gas cleans silicon, silicon nitride and silicon oxide in the chamber.

8. A cleaning method of an apparatus for manufacturing a semiconductor device, comprising:

activating a first cleaning gas by a high frequency power, the first cleaning gas including a fluorocarbon gas and an oxygen gas;

activating a second cleaning gas by a high frequency power, the second cleaning gas including nitrogen;

mixing the activated first cleaning gas and the activated second cleaning gas, thereby forming a mixture of the first cleaning gas and the second cleaning gas; and

exhausting residues cleaned by the mixtuer and remaining gases.

9. The method according to claim 8, wherein the fluorocarbon gas is one of C_3F_8, C_4F_8 and C_4F_8O.

10. The method according to claim 8, wherein the second cleaning gas includes one of N_2, N_2O and NO.

11. The method according to claim 8, wherein a flow rate of the fluorocarbon gas to the oxygen gas is within a range of 0.1 to 0.5.

12. The method according to claim 8, wherein a flow rate of the second cleaning gas to the first cleaning gas is within a range of 0.01 to 0.5.

13. The method according to claim 8, wherein the mixture of the first cleaning gas and the second cleaning gas cleans silicon, silicon nitride and silicon oxide in the chamber.